

obtained, they appear to confirm the previous measures. The diameter found from twenty-eight observations, each consisting of twelve contacts, and made upon separate days between the dates March 19th and June 20th, 1868, was 17.695 at the mean distance of the Earth from the Sun; and though I cannot place much weight upon the result, as being my first essay with the double-image micrometer, it only slightly exceeds Mr. Main's final determination. As there seems, therefore, some reason to doubt whether even the diameter found by Mr. Stone from the Greenwich meridian observations ($16''.944$), to which Mr. Dunkin refers in the last number of the *Monthly Notices*, is large enough, I trust the measurements upon which I am engaged may have a special interest at the present conjuncture.

Durham Observatory, April 24th, 1873.

Observations of the Planet Venus in 1873. By T. G. Elger, Esq.

I beg to lay before the Society the following observations of the planet *Venus* made during the last three months with an achromatic of 4-inch aperture by Cooke.

Whenever the weather permitted, I observed the planet a few hours before sunset, as I always find that the markings on the disk, and the form of the terminator are seen to much greater advantage in broad daylight than at night.

The twenty-five drawings which accompany this paper* are "transfers" from sketches made at the telescope.

Jan. 2nd, 1873. 4^h to $4^h 30^m$. I noticed a conspicuous marking which extended from the N. limb of the planet through the centre of the illuminated disk; its shape and position are shown in Fig. 1. The S. junction of the terminator with the limb was evidently rounded off, while in the vicinity of the N. limb the terminator was slightly concave. (*a.* Fig. 1.)

At 6^h on the same day, the N. half the terminator formed a perfect "Ogee" curve. (Fig. 2.)

Jan. 3rd. 3^h to 4^h . No irregularities in the shape of the terminator were remarked, except the evident rounding off noticed on the previous day. A faint marking, very similar in shape to that observed at 4^h on January 2nd, was seen. (Fig. 3.)

Jan. 5th. 3^h to $3^h 30^m$. An irregular-shaped marking was distinctly visible, in spite of the unfavourable state of the atmosphere. (Fig. 4.)

Jan. 10th. 2^h to $3^h 0^m$. The planet was a beautiful telescopic object; its silvery lustre was however somewhat dimmed in places by faint and ill-defined markings. An irregularity in the terminator, near the S. limb, was steadily seen. (*a.* Fig. 5.)

* These drawings were exhibited at the meeting, and can be seen at the Society's rooms.

Jan. 17th. $2^h 45^m$ to $3^h 10^m$. One faint marking was observed near the limb; and the terminator was evidently polygonal. (Fig. 6.)

Jan. 22nd. $2^h 30^m$ to $3^h 0^m$. A very delicate marking was noted near the S. limb of the planet; the terminator, as on the 17th, was extremely irregular in shape—two elevations were seen at *a* and *b* (fig. 7) the junction of the S. portion of the terminator with the limb was rounded off.

Jan. 27th. $2^h 45^m$ to $3^h 10^m$. Two faint and ill-defined markings were visible; shape of the terminator irregular. (Fig. 8.)

Feb. 11th. $7^h 10^m$ to $8^h 0^m$. The shape of the terminator was very remarkable. Although the planet was undoubtedly slightly gibbous, two cusp-like projections were noticed, that on the S. being rounded off. (Fig. 9.) (*Venus* appeared to be perfectly dichotomized on the evening of Feb. 13th.)

Feb. 20th. The planet was seen to great advantage about 3^h , but no definite markings could be detected, although it was evident enough that the disk was not uniformly bright. An oval white spot was remarked close to the dusky shade of the terminator. (*a*. Fig. 10.) The S. cusp was sharper and longer than the N. cusp, which was evidently truncated; the shading of the terminator in the neighbourhood of the S. cusp was also noteworthy.

On the same day at $6^h 30^m$, the planet was splendidly defined and two markings were visible—a long dusky streak, concentric with the limb, and an isolated dark spot—nearly central. The cusps were both sharp, and the intervening terminator convex. (Fig. 11.)

Feb. 23rd. $5^h 35^m$. A distinct but very delicate marking was observed. The N. cusp was truncated. (Fig. 12.)

Feb. 27th. 3^h to 4^h . Although the definition and atmosphere were favourable for observation, no traces of markings could be seen. The N. cusp was truncated. (Fig. 13.)

On the same day at 7^h a well-defined marking of a very irregular shape was noted. Both the cusps appeared to be sharp, but S. cusp projected most. (Fig. 14.)

Feb. 28th. $6^h 45^m$. A marking was observed not far from the planet's limb, it was very similar in form to that seen on the previous evening. Close to the terminator three small white spots were remarked. Both the cusps were sharp, but the S. cusp appeared to be prolonged beyond a semi-circle. (Fig. 15.)

March 2nd. 3^h . A faint L-shaped marking was seen. Outline of the terminator very irregular. Both cusps sharp. (Fig. 16.)

March 7th. $6^h 30^m$. Two faint streaks were observed at a short distance from the limb. (Fig. 17.)

March 13th. $6^h 15^m$ to $7^h 0^m$. A well-defined marking was visible, which extended from the S. limb to the centre of the illuminated portion of the planet, where it bifurcated and turned abruptly towards the terminator. No peculiarity was noticed in the appearance of the cusps, but the shape of the terminator was remarkably irregular. (Fig. 18.)

On *March 20th* at $7^h 30^m$, and on *March 22nd* at $6^h 40^m$, faint markings were perceived. (Figs. 19 and 20.) On the latter date the phosphorescence of the dark side was very clearly seen.

March 26th. $6^h 10^m$. The planet appeared to be covered with dusky spots, but they were very faint and badly-defined. A bright marking was noticed at *a* (Fig. 21), the N. cusp was sharper than the S. cusp, and projected farther.

On *March 28th* at 6^h , and on *March 29th* at $7^h 25^m$, the S. cusp was noted as differing greatly in shape from the N. cusp, but both were perfectly sharp. A faint white streak was seen on both days extending from the S. limb parallel to the terminator. (Figs. 22 and 23.)

April 1st. $6^h 30^m$ to $7^h 0^m$. A very distinct dark streak was observed nearly concentric with the limb, and not far from it; this marking was seen without difficulty with an achromatic by Peter Dollond of $2\frac{1}{8}$ aperture. (Fig. 24.)

April 2nd. $5^h 0^m$ to $5^h 30^m$. Planet beautifully defined. A faint marking was visible very similar in shape to the dark streak observed on the previous evening. Both the cusps were drawn out to very fine thread-like points. (Fig. 25.)

In making the above observations, I generally used the full aperture of my 4-inch achromatic; but I sometimes found that the details visible on the planet (even on the most favourable occasions) were brought out better with the aperture reduced to $3\frac{1}{2}$ or 3 inches.

I used various negative eye-pieces, from 90 to 210.

I may mention that a few days ago I examined some drawings made by a young friend of mine, Mr. P. Wyatt of Bedford, who diligently scrutinized the planet with an achromatic of $2\frac{3}{4}$ -inch aperture, the general correspondence of our sketches on those occasions when we happened to observe the planet at the same time was very satisfactory.

Phenomena of Jupiter's Satellites. By the Rev. S. J. Perry.

The regular observation of *Jupiter's* satellites was commenced at this Observatory with a view of aiding in procuring as complete a record as possible of these phenomena. The observations have all been taken with the full aperture of the 8-inch achromatic of Troughton and Simms, a power of about 300 being generally employed. The time was observed with a Frodsham chronometer, which has been almost invariably compared, on each night of observation, with the sidereal clock immediately after transits have been taken, the change of rate of both chronometer and sidereal clock being thus almost entirely eliminated.